

# Manitowoc® Koolaire™

## Reach-In Refrigerators and Freezers Installation, Use and Care Guide



This manual contains important information regarding the installation and upkeep of your new Koolaire™ refrigerator or freezer.  
Please read the manual thoroughly prior to equipment handling, set-up, operation, and maintenance.

## Safety Notices

As you work on a Manitowoc Koolaire™ reach-in, be sure to pay close attention to the safety notices in this manual. Disregarding the notices may lead to serious injury and/or damage to the equipment.

Throughout this manual, you will see the following types of safety notices:



### **WARNING**

Text in a **Warning** box alerts you to a potential personal injury situation. Be sure to read the Warning statement before proceeding, and work carefully.



### **CAUTION**

Text in a **Caution** box alerts you to a situation in which you could damage the equipment. Be sure to read the Caution statement before proceeding, and work carefully.

## Procedural Notices

As you work on a Manitowoc Koolaire™ reach-in, be sure to read the procedural notices in this manual. These notices supply helpful information which may assist you as you work.

Throughout this manual, you will see the following types of procedural notices:

### **Important**

Text in an **Important** box provides you with information that may help you perform a procedure more efficiently. Disregarding this information will not cause damage or injury, but it may slow you down as you work.

**NOTE:** Text set off as a **Note** provides you with simple, but useful, extra information about the procedure that you are performing.

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## About This Manual

This manual contains important information on the installation, use, and upkeep of your new your Manitowoc® Koolaire™ reach-in. Each reach-in has been carefully inspected for the highest possible quality. With proper installation and care, you will enjoy many years of reliable performance.

Please read and understand the information contained in this manual prior to installation, start-up, and operation. If you do not understand any part of the information contained in this manual, please contact your Manitowoc® Koolaire™ dealer or call the factory at 1-877-582-5086.

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## Section 1 Warranty

### Model/Serial Number Location

The Koolaire™ data plate, which includes the model number and serial number, as well as important electrical and technical information, is located on the left interior wall of the cabinet at approximately eye level.

For convenience and quick reference, record the model and serial numbers, voltage, and installation date in the spaces below:

<b>Model Number</b>	
<b>Serial Number</b>	
<b>Voltage</b>	
<b>Installation Date</b>	

### Warranty

Warranty coverage on a Koolaire™ reach-in begins on the date it is installed. Please read the warranty certificate included with the cabinet for details.

#### PARTS COVERAGE

1. A Koolaire™ reach-in cabinet and the refrigeration and mechanical components are warranted against defects in materials and workmanship for a period of two (2) years from the date of original installation.
2. The evaporator coil and compressor are covered by an additional three (3) years (five years total) warranty beginning on the date of the original installation.

**Note:** The additional three year evaporator coil warranty does not apply to parts such as fan motors, defrost elements, housings, electrical wiring, or controls that are attached to the evaporator coil.

#### LABOR COVERAGE

Labor is covered to repair or replace defective components for two (2) years from the date of the original installation.

### EXCLUSIONS FROM WARRANTY

1. Normal start-up, maintenance, adjustments, and cleaning.
2. Interior cabinet light bulb.
3. Repairs due to unauthorized modifications to the Refrigeration System/Reach-In Cabinet or the use of non-standard parts without prior written approval.
4. Damage caused by improper installation of the Reach-In cabinet, electrical supply, water supply or drainage, or damage caused by floods, storms, or other acts of God.
5. Premium labor rates due to holidays, overtime, travel time, mileage flat rate, service call charges and miscellaneous tools and material charges not listed on the payment schedule. Additional labor charges resulting from inaccessibility of the Reach-In are also excluded.
6. Parts or assemblies subjected to misuse, abuse, neglect or accidents.
7. Damage to the interior of cabinet or refrigeration system as a result of storing open acidic food containers.
8. Claims for special indirect or consequential damages, including food spoilage or product loss.

### Warranty Service

To insure warranty coverage, a qualified service company must perform the warranty repair.

If the dealer the Koolaire™ reach-in was purchased from does not perform warranty service, please call 1-877-582-5086 for assistance.

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## Section 2 Installation

### General



#### CAUTION

These instructions are of the utmost importance in assuring that the Manitowoc Koolaire™ cabinet operates as designed, and must be followed closely.

### Positioning the Cabinet



#### CAUTION

When selecting a permanent location for the cabinet, observe the following guidelines. Failure to do so may cause reduced performance and efficiency, cause damage, and void your warranty.

### CABINET LOCATION GUIDELINES

- Install the cabinet in an indoor environment only.
- The air temperature entering the refrigerator or freezer condenser should be between 55°F (13°C) and 100°F (38°C).
- Allow space for air circulation in the refrigeration condensing unit compartment on refrigerators and freezers. The minimum space requirements are:
  - 10" (25 cm) on top
  - 4" (10 cm) at the back
  - 4" (10 cm) on each side
- The floor must be strong enough to support the weight of the cabinet and product load.



#### CAUTION

A fully loaded reach-in cabinet can weigh more than 3,000 pounds.

### Heat of Rejection

All refrigeration equipment rejects heat through the condenser. It is helpful to know the amount of heat rejected, to determine the additional load that will be placed on air conditioning equipment.

Model	Solid Door	Half Door	Glass Door	Refrigerator BTU Per Hour	Freezer BTU Per Hour
1 Door	KR-1	KR-101		2600	1700
			KR-1GD	3780	N/A
2 Door	KR-2	KR-201		2600	2840
			KR-2GD	4600	N/A
3 Door	KR-3	KR-301		3780	3450
			KR-3GD	5580	N/A

## Uncrating

### **WARNING**

Never attempt to tilt the cabinet alone. Always use two or more people when tilting the cabinet to remove the shipping skid or to move it through doorways.

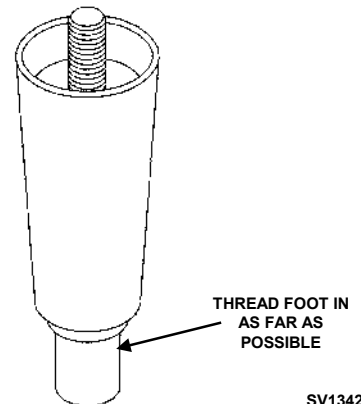
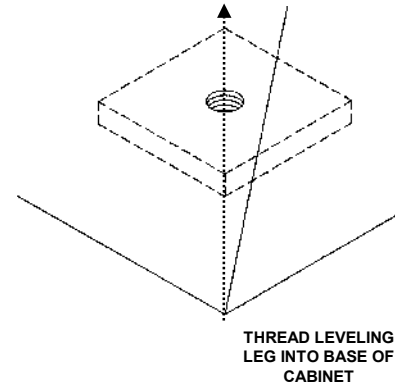
1. Remove the bottom shipping skid using one of the methods below:
  - Lay the cabinet on its back, elevated and supported by wooden blocks. Remove the skid mounting bolts and separate the skid from the cabinet.
  - Tilt the cabinet from side to side and remove the mounting bolts. Support the weight of the cabinet apart from the skid.
2. Install the legs or casters and torque them to 360 inch-pounds. Refer to the drawing at right.
3. Return the cabinet to the upright position.
4. Remove any remaining crating materials.

### **CAUTION**

If the cabinet was placed on its back while moving it or while removing the bottom shipping skid, wait at least two hours after returning the cabinet to the upright position before starting the refrigeration system.

### **CAUTION**

Never use sharp instruments to cut the plastic or cardboard crating materials. Damage to the cabinet exterior may result.



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## Installing Cabinet Legs



## Leveling the Cabinet

The cabinet must be leveled after it is positioned in its permanent location. This insures proper door alignment on all cabinets, and adequate condensate water drainage and proper refrigeration system operation.

## Leveling the Cabinet



### CAUTION

If casters are installed instead of legs, the floor must be leveled before final positioning of the cabinet.

1. Place a level on top of the cabinet.
2. Turn the leveling foot of the lowest corner leg to center the bubble in the level.
3. Adjust each of the other corners until the bubble is centered and the cabinet is stable.
4. Re-check the cabinet from side to side and from front to rear with the level. Adjust the leg levelers as necessary.

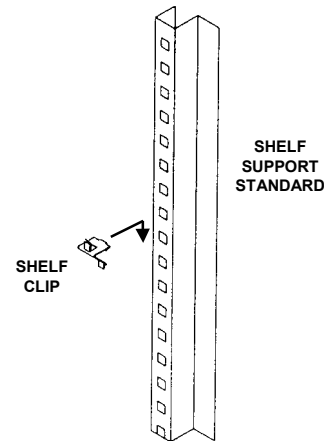
## Shelf/Tray Slide Installation

### SHELVES

1. Determine the desired shelf location.

NOTE: The shelves may be located at any position in 1" increments. Optimum spacing is one shelf near the bottom of the cabinet, one shelf near center height, and one shelf at eye level (Refer to drawing).

2. Install four clips per shelf, one at each corner. The shelf clips slip into the 3/8" holes and slide down.
3. Make sure that the clips are level from side to side and from front to rear at each corner.
4. Install the shelves with the smaller wires running from front to back.



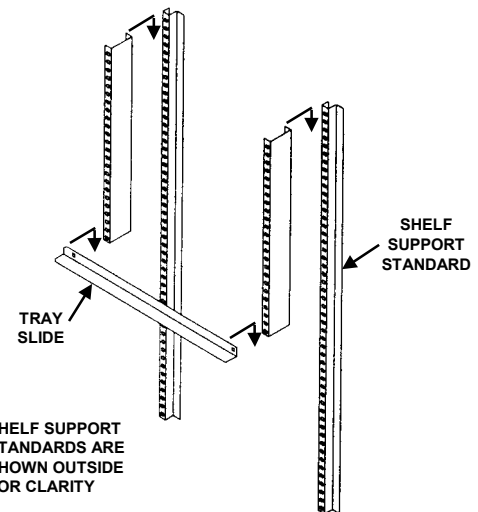
SER.3

### Shelf Installation

### TRAY SLIDES

Tray slides are optional accessories and must be ordered separately. To install a tray slide:

1. Locate the appropriate square shelf standard holes at the desired height.
2. Insert the tabs of each slide into the 3/8" holes in the shelf support standards and pull it straight down to lock it into place (Refer to drawing below).



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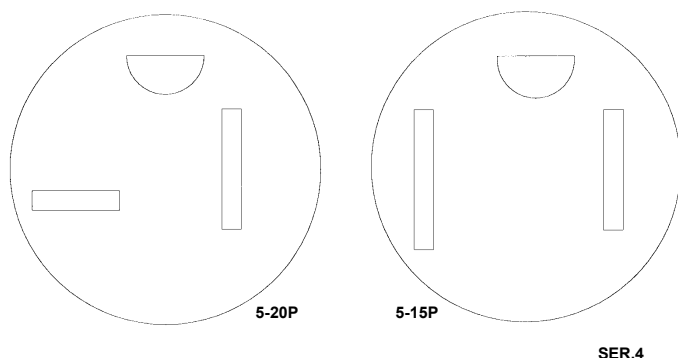
### Tray Slide Installation

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## Section 3 Start Up

### Electrical Requirements

All cord-connected units should be plugged into a grounded and properly sized electrical outlet with appropriate overcurrent protection. Refer to the drawing below for electrical plug configurations.



**5-20P and 5-15P Electrical Plug Configurations**

All permanently connected (hard-wired) units are fitted with a power junction box and 6" pigtail wires for power connection.

Connect one end of the power line to the pigtail from the cabinet junction box. Connect the other end to a properly sized electrical source.

As a rule, the power lines must be enclosed inside a conduit secured to the power junction boxes on both ends.

#### **CAUTION**

Power installation must be in compliance with the National Electrical Code and all applicable local and state codes.

#### **WARNING**

Never use an extension cord.

Never alter the power cord or plug supplied with the cabinet.

After the power source has been connected, turn on the main power switch. The switch is located on the cabinet top, behind the front panel.

## Electrical Specifications

REACH-IN REFRIGERATORS	Model	Voltage/ Phase/Cycles	Total Amps	Maximum Fuse Size	ANSI Electrical Plug Configuration
Full Door	KR-1	115/60/1	9.9	15 amp	5-15P
		230/50/1	**	**	**
	KR-2	115/60/1	10.4	15 amp	5-15P
		230/50/1	**	**	**
	KR-3	*115 & 208-230/60/1	Minimum circuit amps 15.1	20 amp	Hard-Wired
		230/50/1	**	**	**
Half Door	KR-101	115/60/1	9.9	15 amp	5-15P
		230/50/1	**	**	**
	KR-102	115/60/1	10.4	15 amp	5-15P
		230/50/1	**	**	**
	KR-103	*115 & 208-230/60/1	Minimum circuit amps 15.1	20 amp	Hard-Wired
		230/50/1	**	**	**
Glass Door	KR-1GD	115/60/1	14.7	20 amp	5-20P
		230/50/1	**	**	**
	KR-2GD	115/60/1	16.0	20 amp	5-20P
		230/50/1	**	**	**
	KR-3GD	*115 & 208-230/60/1	Minimum circuit amps 15.3	20 amp	Hard-Wired
		230/50/1	**	**	**

REACH-IN FREEZER	Model	Voltage/ Phase/Cycles	Total Amps	Maximum Fuse Size	ANSI Electrical Plug Configuration
Full Door	KF-1	115/60/1	12.4	20 amp	5-15P
		230/50/1	**	**	**
	KF-2	115/60/1	16	20 amp	5-20-P
		230/50/1	**	**	**
	KF-3	*115 & 208-230/60/1	Minimum circuit amps 15.8	20 amp	Hard-Wired
		230/50/1	**	**	**
Half Door	KF-101	115/60/1	12.4	20amp	5-15P
		230/50/1	**	**	**
	KF-201	208/230/60/1	16	20 amp	5-20-P
		230/50/1	**	**	**
	KF-301	*115 & 208-230/60/1	Minimum circuit amps 15.8	20 amp	Hard-Wired
		230/50/1	**	**	**

\* 4 wire dual voltage required: 115 Volt for the lights and fans, 208-230 Volt for the compressor.

\*\* Data not available at time of printing.

## Condensate Water Removal (Refrigerators and Freezers)

Manitowoc cabinets are equipped with a condensate vaporizer system. This system uses energy-saving hot gas supplied by the refrigeration system lines. No drain connection is required.

## Defrost Systems

### GENERAL

Refrigerator coils operate at temperatures below freezing (32°F). During compressor “off” time, the evaporator fan continues to circulate 38°F refrigerator compartment air through the evaporator coil. This air circulation raises the coil temperature above the freezing point, melting any frost that may have accumulated.

The run-off water is drained into the vaporizer pan and is evaporated by the hot gas refrigeration line during compressor “on” time.

Freezer coils are defrosted electrically at user-determined times.

NOTE: A freezer’s evaporator fans do not run immediately upon start-up or during and immediately following the defrost cycles. The fans start when the coil temperature falls below freezing. This prevents the fans from blowing moisture or heated air on the stored products.

### DEFROST SETTINGS

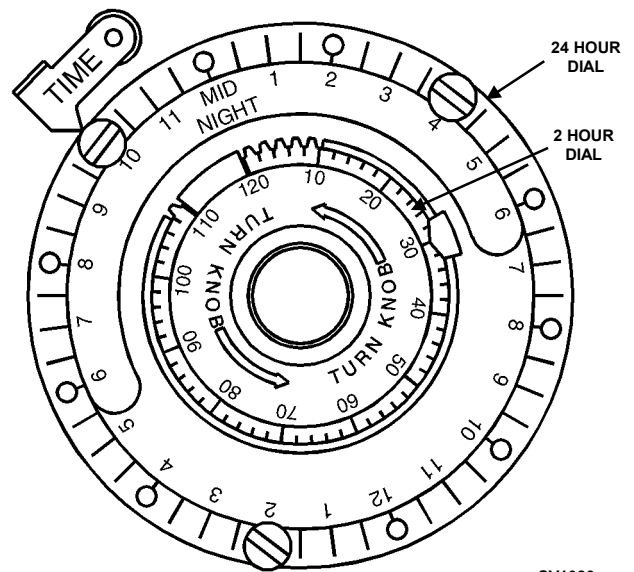
The defrost timer is factory preset to defrost the evaporator coil each day at 2:00 AM, 8:00 AM, 2:00 PM, and 8:00 PM.

If you wish to change the defrost times, remove the pins from the outer dial and re-insert them into the desired time slots. (Refer to drawing.)



### CAUTION

Leave at least one hole between adjacent pins.



**Defrost Time Clock**

### Important

Set the defrost timer to defrost the reach-in during the lowest usage periods.

### SETTING TIME OF DAY

The defrost timer must be set to “real time” after the power is turned on, or after a power failure.

To set the time:

1. Grasp the knob in the center of the inner dial.
2. Turn it counterclockwise to rotate the outer dial.
3. Line up the current time of day on the outer dial with the pointer.

### ADJUSTING DEFROST DURATION

The defrost cycle is terminated by a temperature-sensing switch located on the suction line, adjacent to the evaporator coil.

The defrost duration is factory-set. Normally, no adjustment is required. For a longer defrost time, press down on the inner dial pointer and rotate the pointer until the desired time lines up.

### Important

The coil defrosts only until the temperature-sensing switch terminates the cycle, regardless of the defrost duration that is set.

## Temperature Control

### REFRIGERATORS AND FREEZERS

The temperature controls are factory-set to maintain an average temperature of 38°F (3°C) in refrigerators, and an average temperature of 0°F (18°C) in freezers.

The temperature variance is 6-8 F (2°-4°C) degrees. A freezer should run between -2°F to +4°F (3°C to -15°C). A refrigerator should run between +35° to +42°F (1°C to 5°C).

For a different cabinet temperature setting, turn the temperature control knob, located behind the front cabinet louver.



#### CAUTION

Setting the temperature control to the coldest setting may cause the coil and/or air ducts to freeze and ice up. This will eventually result in a warmer cabinet temperature.

If ice accumulation occurs and the temperature is lower than the guidelines, turn the control knob to a warmer setting.



#### CAUTION

Allow the reach-in to reach proper operating temperature before filling it with product. Do not place hot or steaming foods in the cabinet.

## Loading Shelves

For maximum operating efficiency, load the shelves with space between the stored items. This allows air to circulate properly.



#### CAUTION

Do not store more than 250 pounds of product on any shelf and no more than 800 pounds of product per cabinet.



#### CAUTION

Store products with high acid content (such as lettuce, other fresh vegetables or fruits, salad dressings, etc.) in closed containers. This will prevent corrosion on the evaporator coil and other metal parts in the air distribution system.

#### Important

Uncovered food will dehydrate much more rapidly than covered food. For best food quality, always store in covered container.

## Section 4 Cleaning

### Exterior

Clean cabinet exterior surfaces with a solution of mild soap and water. To minimize streaking, follow with a fresh water rinse.

If stainless steel becomes discolored, scrub only in the direction of the finished grain.

For high shine, see your kitchen equipment dealer for a high-quality stainless steel polish.

**CAUTION**

Do not use steel wool, caustic soap, or abrasive cleaners, as these may damage the metal finish. Alcohol-based cleaners may damage the nylon door cams.

### Interior

Clean cabinet interior surfaces with warm water and baking soda, applied with a cloth or sponge.

The shelves and shelf support standards can be removed without special tools to facilitate cleaning.

Wash door gaskets weekly with a mild soap and water solution, followed by a fresh water rinse.

While cleaning, check the door gaskets for proper sealing. Adjust if needed.

**CAUTION**

Never use cleaners that are not approved for use where food may come into contact with cabinet interior surfaces.

**CAUTION**

Do not use steel wool, caustic soap, or abrasive cleaners, as these may damage the metal finish.

## Cleaning the Condenser Coil



### WARNING

Disconnect electric power before cleaning.

A dirty condenser restricts airflow, resulting in excessively high operating temperatures. This reduces efficiency and shortens component life.

The washable aluminum filter is designed to catch dust, dirt, lint and grease. This helps keep the condenser clean. For efficient operation, it is very important to clean the condenser coil surface and keep it free of dust, dirt, and lint.

The condition of the air filter and condenser coil should be checked monthly.



### CAUTION

Failure to clean and maintain the condenser coil properly will result in reduced air circulation through the condenser fins. This will cause reduced efficiency, high operating pressures, and possible shortened compressor life.



### WARNING

Condenser fins are sharp. Use care when working around them.

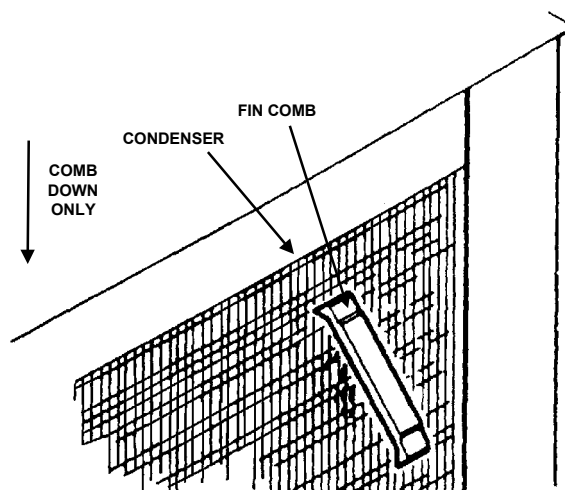
## CONDENSER CLEANING PROCEDURE

Use this procedure to clean the condenser monthly:

1. Remove and clean the filter with a mild soap and water solution.
2. Clean the outside of the condenser with a soft brush or a vacuum with a brush attachment. Clean from top to bottom not side to side. Be careful not to bend the condenser fins.
3. Shine a flashlight through the condenser to check for dirt between the fins. If dirt remains:
  - A. Blow compressed air through the condenser from the inside. Be careful not to bend the fan blades.
  - B. Use a commercial condenser coil cleaner. Follow the directions and cautions supplied with the cleaner.

Repeat step 3 until all dirt is removed.

After cleaning, straighten any bent condenser fins with a fin comb.



### Using a Fin Comb



### WARNING

Disconnect electric power before cleaning.

## CLEANING THE FAN BLADES AND MOTOR

If necessary, clean the fan blades and motor with a soft cloth. If it is necessary to wash the fan blades, cover the fan motor to prevent moisture damage.



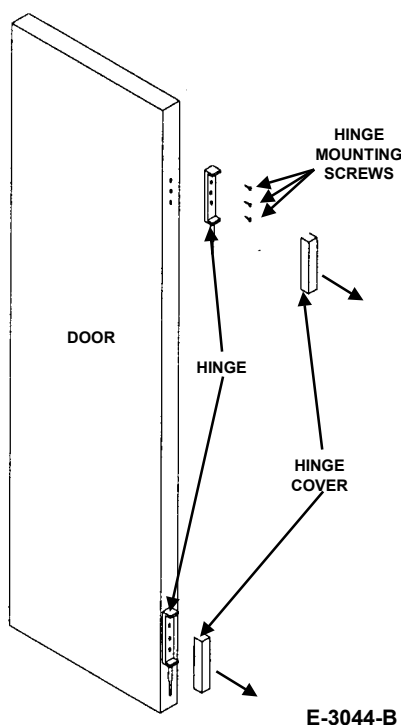
## Section 5 Adjustments and Calibrations

### Adjustments

Cabinet doors may require some adjustment after a period of usage, depending upon the frequency of door openings. This is normal. Follow the appropriate procedure below:

#### SOLID DOOR ADJUSTMENT

1. Remove the metal hinge covers that conceal the three hinge mounting screws. Gently pry it off with a flat-bladed screwdriver.



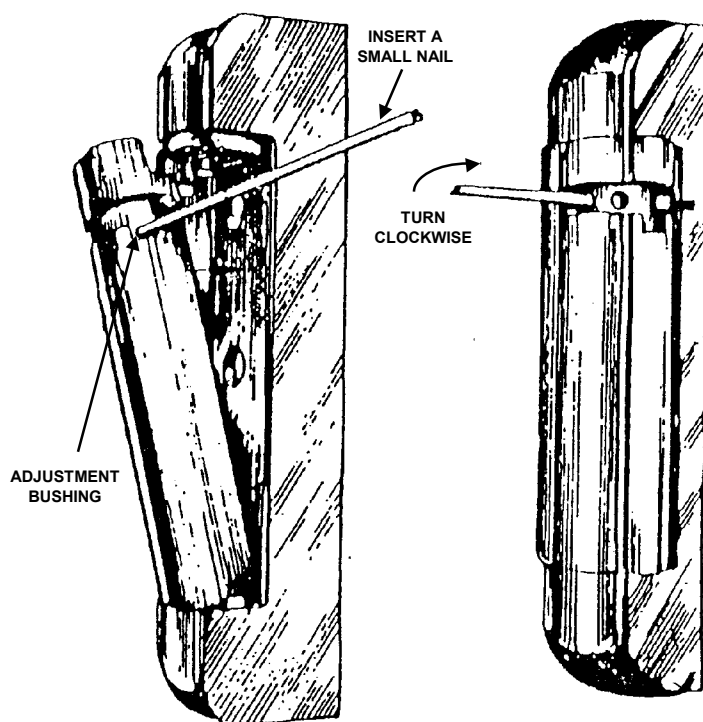
#### Hinge/Hinge Cover

2. Loosen the three hinge mounting screws approximately two rotations, using a Phillips screwdriver.
3. While a second person firmly pushes the door closed to the front face of the cabinet, re-tighten the screws.
4. Re-install the hinge covers.

#### GLASS DOOR ADJUSTMENT

To adjust the spring tension:

1. Locate the adjustment bushing on the hinges. This bushing is on top of the hinge for right-hand doors and on the bottom for left-hand doors.
2. Insert a small nail (1/8") into a hole in the adjustment bushing. Wind the bushing clockwise until the pin can be removed from the bushing.



#### Hinge Adjustment

3. Continue winding the bushing clockwise until the desired tension is achieved.
4. Re-insert the bushing pin.

#### CAUTION

Do not over-tighten the hinge spring. Manitowoc recommends adjusting the hinge adjustment bushings one hole at a time.

## Thermometer Calibration

Occasionally, the rigors of shipping and installation can shift the thermometer out of proper adjustment.

If the accuracy of the thermometer is in question, place another thermometer inside the cabinet at approximately mid-height and compare the readings.

If the thermometer requires adjustment, follow the procedure below.

1. Gently pry off the clear thermometer cover lens with a small flat-bladed screwdriver.
2. While carefully holding the dial indicator needle with one hand, turn the slotted center pivot with a flat-bladed screwdriver. Turn clockwise to decrease the reading and counterclockwise to increase the reading.
3. Replace the clear thermometer cover lens by pressing it into place around the perimeter.

## Section 6 Before Requesting Service

### Troubleshooting Guide

Before requesting any service on your Manitowoc cabinet, please check the following points.

This guide is not comprehensive; it is intended as a reference for solutions to common problems.



#### **WARNING**

Disconnect electric power before performing any service.

Symptom	Possible Cause	Corrective Action
Cabinet not running	Fuse blown or circuit breaker tripped.	Replace fuse or reset circuit breaker.
	Power cord unplugged.	Plug in power cord.
	Thermostat set too high.	Set thermostat to lower temperature.
	Main power switch turned off.	Turn main power switch on.
	Cabinet in defrost cycle. (Freezer models)	Wait for defrost cycle to finish.
Condensing unit runs for long periods or continuously	Excessive amount of warm product placed in cabinet.	Allow adequate time for product to cool down.
	Prolonged door openings or door(s) ajar.	Make sure door(s) are closed when not in use. Avoid prolonged door openings.
	Door gasket(s) not sealing properly.	Check gasket condition. Adjust door or replace gasket if necessary.
	Dirty condenser coil.	Clean the condenser coil.
	Evaporator coil iced over.	Turn unit off and allow coil to defrost. Make sure thermostat is not set too cold. Also, check gasket condition.
Cabinet temperature is too high	Thermostat set too high.	Set thermostat to lower temperature.
	Poor air circulation in cabinet.	Re-arrange product to allow proper air circulation.
	Exterior thermometer is out of calibration.	Re-calibrate thermometer.
	Excessive amount of warm product placed in cabinet.	Allow adequate time for product to cool down.
	Prolonged door openings or door(s) ajar.	Make sure door(s) are closed when not in use. Avoid prolonged door openings.
	Dirty condenser coil.	Clean the condenser coil.
	Evaporator coil iced over.	Turn unit off and allow coil to defrost. Make sure thermostat is not set too cold. Also, check gasket condition.
Cabinet is noisy	Loose part(s).	Locate and tighten loose part(s).
	Tubing vibration.	Insure tubing is free from contact with other tubing or components.
Refrigerator is freezing product	Thermostat is set too low.	Set thermostat to higher temperature.
Compressor will not start - hums and trips on overload protector	Dirty condenser coil.	Clean the condenser coil.
	Not enough cabinet clearance for proper refrigeration system operation.	Move cabinet or make other adjustments to gain proper cabinet clearances.
	Low voltage to cabinet.	Check and correct incoming voltage to cabinet.

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We reserve the right to make product improvements at any time.

Specifications and design are subject to change without notice.

**MANITOWOC® Koolaire™.**

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